

Service Manual

REPAIR & ADJUSTMENTS



**ORDER NO.
ART-620-0**

**NON SWITCHING AMP
STEREO AMPLIFIER**

A-5

MODEL A-5 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	120V only	U.S.A. model
S	110V, 120V, 220V and 240V (Switchable)	General export model
KC	120V only	Canada model
YP	240V only	Australia model
HE	220V and 240V (Switchable)	Europe model
HB	220V and 240V (Switchable)	United Kingdom model

- This service manual is applicable to the KU type. When repairing the HE, HB types, please see the additional service manual (ART-621), and see the ART-622 for S, YP and KC types.
- For the circuit description, please refer to the supplement of model A-6 service manual (ART-762).
- Ce manuel d'instruction se réfère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

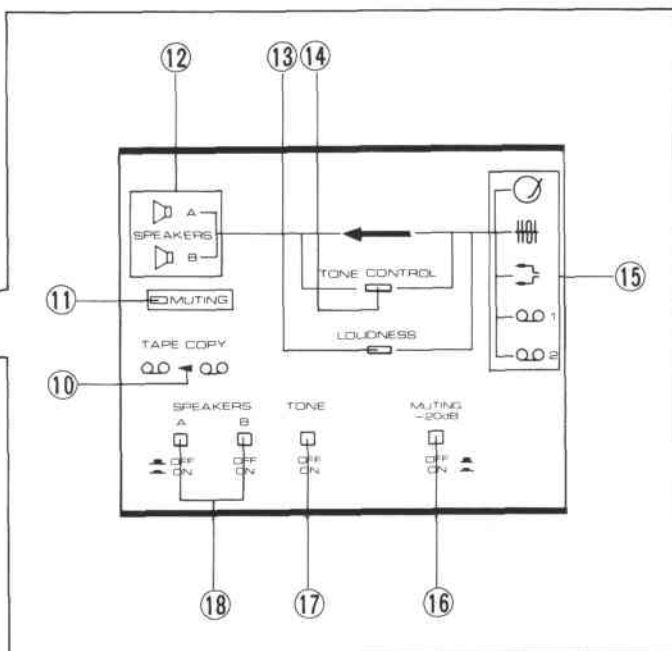
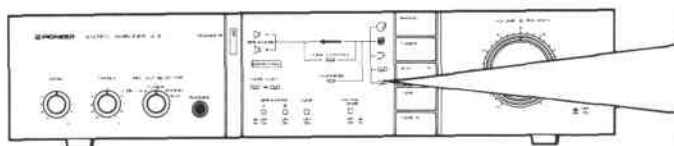
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Printed in Japan



⑩ TAPE COPY INDICATOR

This indicates the tape deck which is recording in accordance with the position selected by the REC OUT SELECTOR switch.

⑪ MUTING INDICATOR

This lights up red in accordance with the ON position of the MUTING switch.

⑫ SPEAKERS A/B INDICATORS

These light when one of the SPEAKERS switches has been depressed.

⑬ LOUDNESS INDICATOR

This lights when the LOUDNESS switch has been set to ON.

⑭ TONE CONTROL INDICATOR

This lights when the tone control circuitry has been actuated.

⑮ FUNCTION INDICATORS

The indicator corresponding to the selected function switch lights.

⑯ MUTING -20 dB SWITCH

The volume is attenuated by -20 dB when this switch is depressed to the ON position (MUTING indicator lights). The switch can be used effectively when the stylus descends onto the record during record play, when the sound is to be turned down temporarily and when you want to adjust the sound precisely as you listen to a program source under low sound level conditions.

⑰ TONE SWITCH

When this switch is depressed to the ON position (TONE CONTROL indicator lights), the input signal's tone quality can be adjusted with the tone controls.

⑱ SPEAKERS SWITCHES

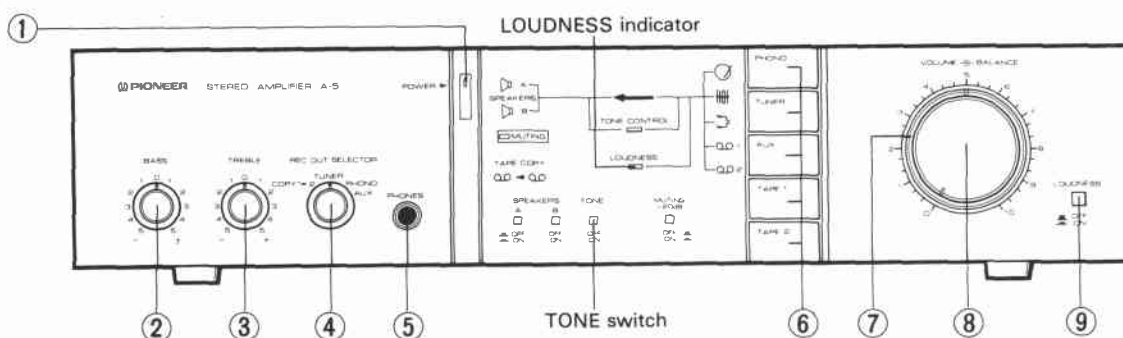
These are used to select the speakers through which you will listen to the sound. When one of the switches is depressed, the corresponding speaker indicator will light to indicate that the selected speakers are now working.

A: The sound is heard from the speakers connected to the speaker A terminals.

B: The sound is heard from the speakers connected to the speaker B terminals.

No sound will be heard when SPEAKERS A and B switches are both released. This is the position at which the sound can be heard through the headphones.

3. FRONT PANEL FACILITIES



① POWER SWITCH

Power is supplied to the stereo amplifier as soon as this switch is depressed to the ON position. The power is turned off when the switch is released to the OFF position.

② BASS CONTROL

This is used to adjust the bass (low-frequency range) sound. Rotate this control with the TONE switch depressed to the ON position. The bass is emphasized when the control is rotated clockwise from its center position and attenuated when it is rotated counterclockwise.

③ TREBLE CONTROL

This is used to adjust the treble (high-frequency range) sound. Rotate this control with the TONE switch depressed to the ON position. The treble is emphasized when the control is rotated clockwise from its center position and attenuated when it is rotated counterclockwise.

④ REC OUT SELECTOR SWITCH

This is used to select the output signal which is fed out to the TAPE REC 1, 2 jacks.

COPY 1 ▶ 2: The output signal is fed out from the TAPE 1 PLAY jacks to the TAPE 2 REC jacks (when dubbing a tape from TAPE 1 to TAPE 2).

TUNER: The output signal from the TUNER jacks is fed out to the TAPE 1 REC and TAPE 2 REC jacks.

PHONO: The output signal from the PHONO jacks is fed out to the TAPE 1 REC and TAPE 2 REC jacks.

AUX: The output signal from the AUX jacks is fed out to the TAPE 1 REC and TAPE 2 REC jacks.

⑤ PHONES JACK

Connect the plug on your headphones to this jack when listening to a program in private.

To listen to a program through the headphones, release both the SPEAKERS A and B switches to the OFF positions.

⑥ FUNCTION SWITCHES

These are used to select the sound source. At the left of each switch there is a function indicator (pictographic) which lights when the corresponding switch has been depressed. This indicates that the lighted function has been selected.

PHONO: Depress for playing records on a turntable connected to the PHONO jacks.

TUNER: Depress for listening to a program on a tuner connected to the TUNER jacks.

AUX: Depress for listening to the sound from a stereo component connected to the AUX jacks.

TAPE 1: Depress for listening to a tape in a tape deck connected to the TAPE 1 jacks or to monitor a recording.

TAPE 2: Depress for listening to a tape in a second tape deck (or other adaptor component) connected to the TAPE 2 jacks or to monitor a recording.

NOTE:

Depress only one function switch at a time. The desired program source may not be selected if two or more switches are depressed at the same time.

⑦ BALANCE CONTROL

This is used to adjust the balance of the sound from the left and right channels. When rotated clockwise from its center position, the volume of the left (L) channel is reduced; when rotated counterclockwise, the volume of the right (R) channel is reduced.

⑧ VOLUME CONTROL

This is used to adjust the volume of sound heard through the speakers or headphones. No sound is heard when it is set to the "0" position. To increase the volume, rotate this control slowly clockwise (↻).

⑨ LOUDNESS SWITCH

The bass and treble sound is emphasized when this switch is depressed to the ON position (LOUDNESS indicator lights) under low volume listening conditions. The sound comes alive even when the volume is low.

1. SPECIFICATIONS

Amplifier Section

Continuous Power Output is 35 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.009% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms, from AUX)

continuous rated power output No more than 0.009%
17.5 watts per channel power

output No more than 0.007%

Intermodulation Distortion (50 Hertz:7,000 Hertz = 4:1, 8 ohms, from AUX)

continuous rated power output No more than 0.007%

17.5 watts per channel power output No more than 0.005%

Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms) 50

Input Sensitivity/Impedance

PHONO 2.5 mV/50 kilohms

TUNER, AUX, TAPE PLAY 1, 2 150 mV/50 kilohms

Phono Overload Level (T.H.D. 0.004%, 1,000 Hz)

PHONO 140 mV

Output (Level/Impedance)

TAPE REC 1, 2 150 mV/2.7 kilohms

Speaker A/OFF, B/OFF (6~16 Ω)

Frequency Response

PHONO (RIAA Equalization)

..... 20 Hz to 20,000 Hz \pm 0.5 dB

TUNER, AUX, TAPE PLAY 1, 2 5 Hz to 100,000 Hz \pm 3 dB

Tone Control

BASS \pm 8 dB (100 Hz)

TREBLE \pm 8 dB (10 kHz)

Loudness Contour (Volume control set at -40 dB)

..... +6 dB (100 Hz), +3 dB (10 kHz)

Hum and Noise (IHF, short-circuited A network)

PHONO 70 dB

TUNER, AUX, TAPE PLAY 1, 2 100 dB

Muting -20 dB

Miscellaneous

Power Requirements 120 V, 60 Hz

Power Consumption 180 Watts (UL) 220 VA (CSA)

Dimensions 420 (W) x 98 (H) x 367 (D) mm

16-9/16 (W) x 3-7/8 (H) x 14-11/16 (D) in

Weight (without package) 6.5 kg (14 lb 5 oz)

Furnished Parts

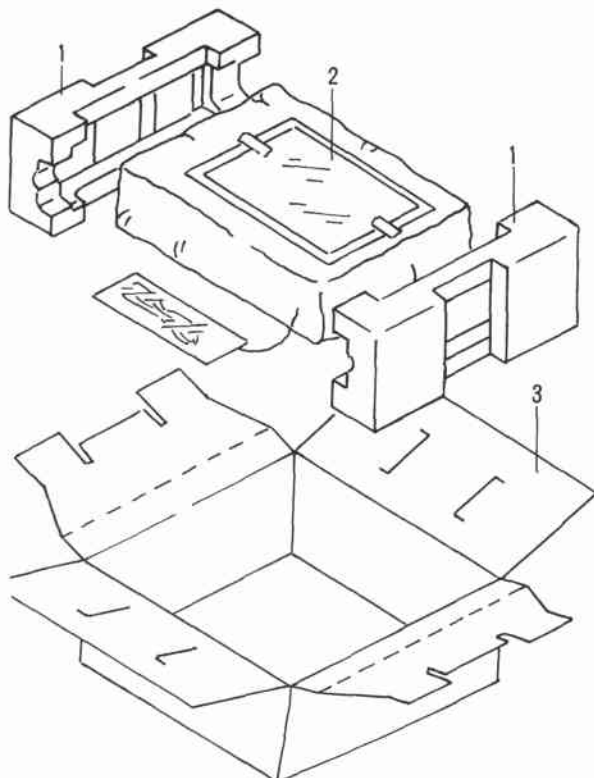
Operating Instructions 1

**Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifier.*

NOTE:

Specifications and design subject to possible modification without notice.

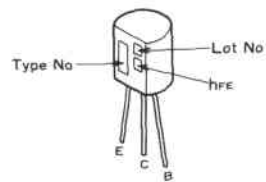
2. PACKING



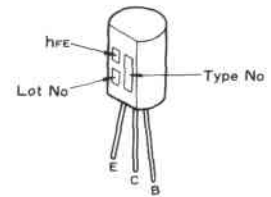
Mark	No.	Part No.	Description
	1.	AHA-292	Side pad
	2.	ARB-416	Operating instructions (English)
	3.	AHD-922	Packing case

External Appearance of Transistors and ICs

2SA750
2SA1015
2SC1400
2SC1815

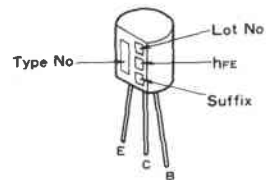


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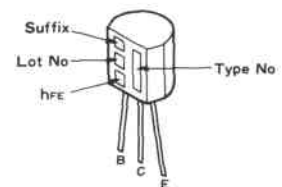


A

2SA733A
2SC945A

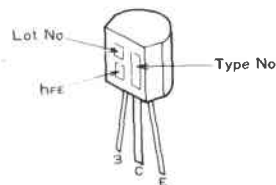


2SC1914A

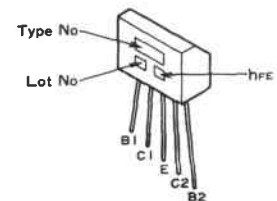


B

2SA850
2SA905
2SC1735
2SC1915

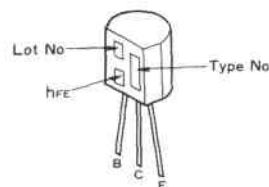


2SC2259

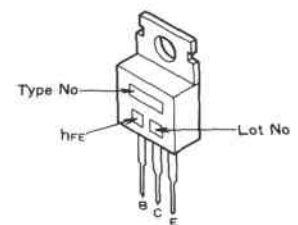


C

2SA1100
2SC2575

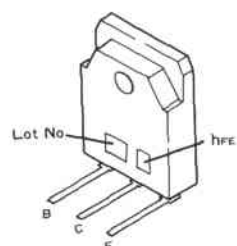


2SD313
2SD880

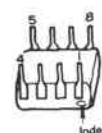


D

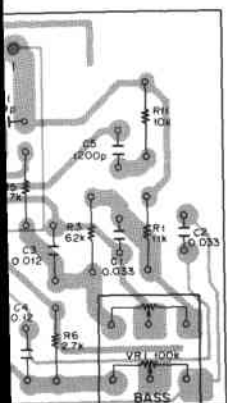
2SA1104/A/
2SC2579/A/



NJM4558DX
 μ PC4558C-P



TONE CONTROL Ass'y



HEADPHONES JACK Ass'y

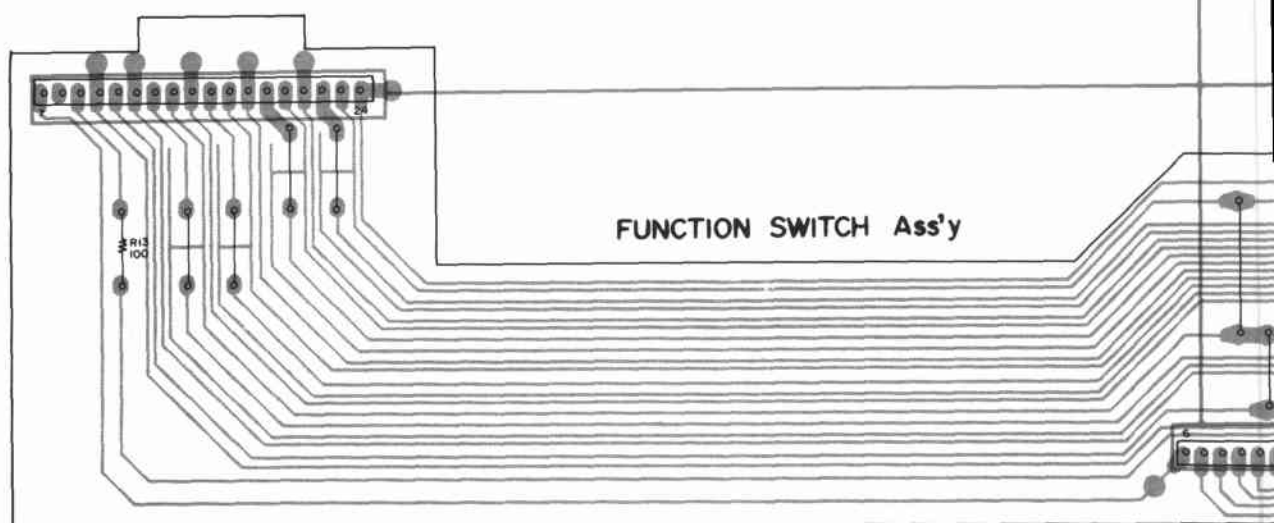
7. P.C. BOARDS CONNECTION DIAGRAM

A

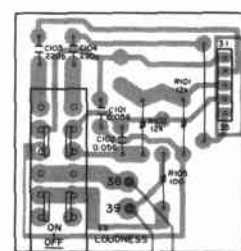
B

C

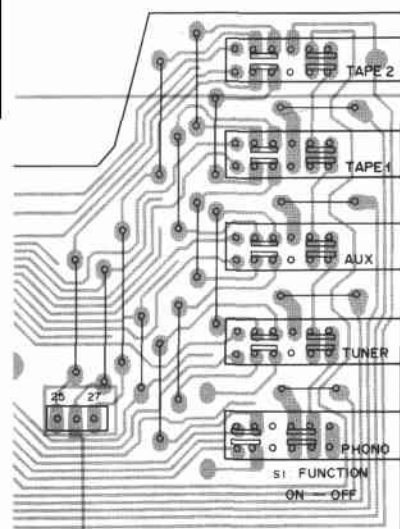
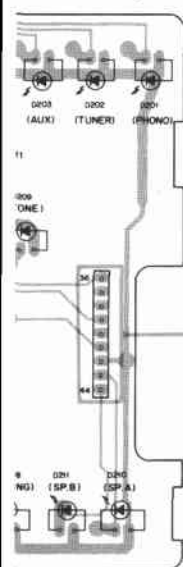
D



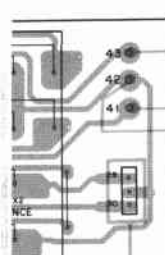
LOUDNESS Ass'y



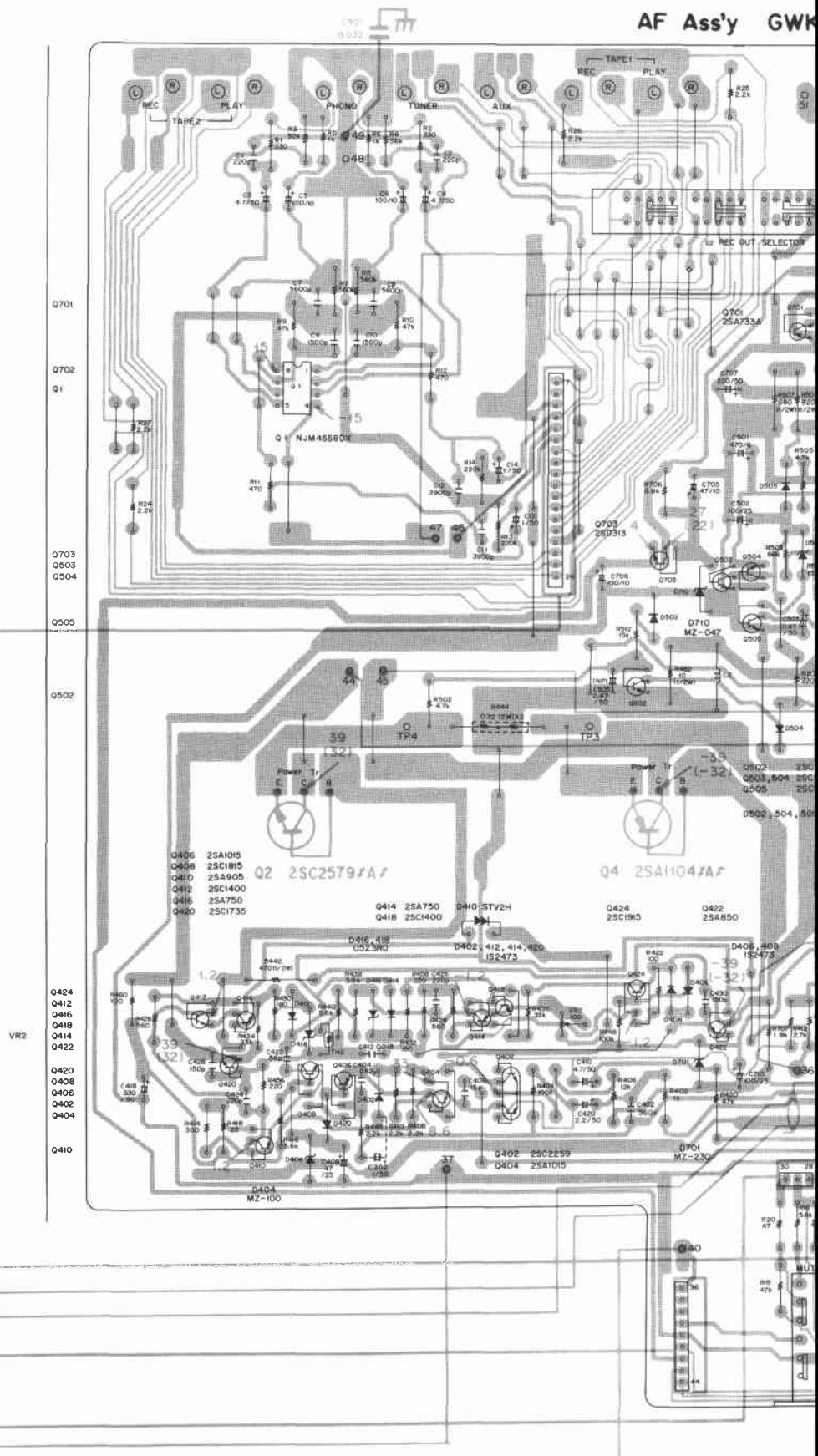
OR Ass'y



ME Ass'y

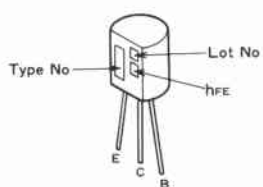


AF Ass'y GWK

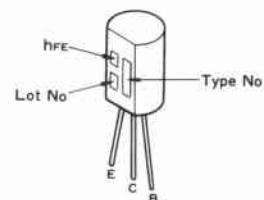


External Appearance of Transistors and ICs

2SA750
2SA1015
2SC1400
2SC1815

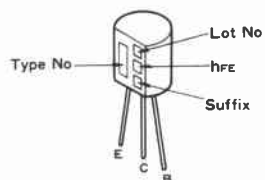


2SC1384

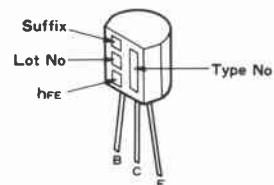


A

2SA733A
2SC945A

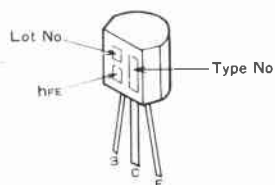


2SC1914A

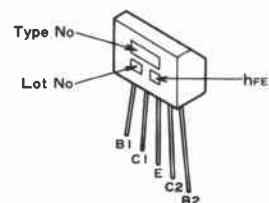


B

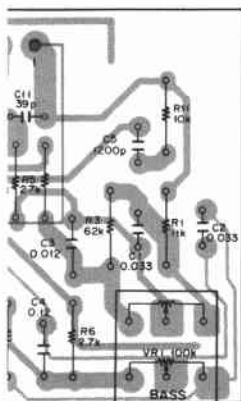
2SA850
2SA905
2SC1735
2SC1915



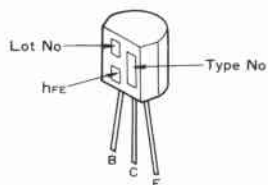
2SC2259



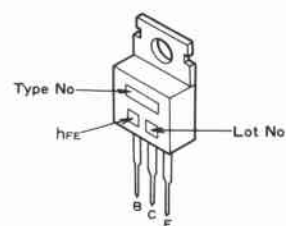
TONE CONTROL Ass'y



2SA1100
2SC2575



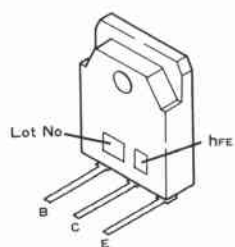
2SD313
2SD880



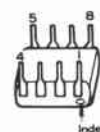
C

HEADPHONES
JACK Ass'y

2SA1104/A/
2SC2579/A/



NJM4558DX
 μ PC4558C-P



D

6. EXPLODED VIEWS

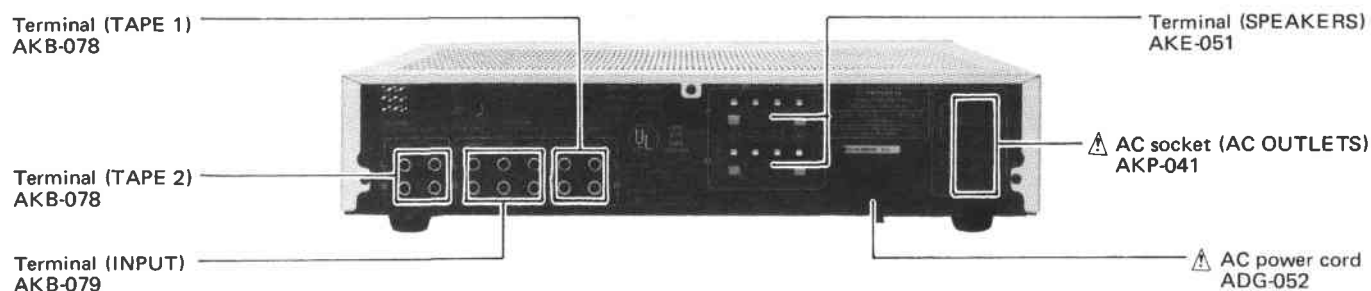
Parts List of Exterior Components

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	ANE-345	Top cover		6.	AAB-272	Knob (BALANCE)
	2.	VBZ30P060FMC	Screw 3x6		7.	NKX1FUC	Nut
	3.	ANM-027	Front panel assembly		8.	WAX1F160U050	Washer
	4.	AAB-271	Knob (BASS, TREBLE, REC OUT SELECTOR)		9.	BBT30P080FZK	Screw 3x8
	5.	AAB-270	Knob (VOLUME)	101.			Lug
				102.			Bottom plate

Parts List of Interior Components

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
⚠	★	1.	ATT-800		24.	MTZ30P100FZK	Screw 3x10
		2.	VXZ40P080FMC		25.	AEC-327	Strain relief
		3.	AEC-383				
		4.	AAD-338	⚠	26.	ADG-052	AC power cord
		5.	VBZ30P060FMC		27.	AKE-051	Terminal (SPEAKERS)
					28.	WA35F100N080	Washer
		6.	ABN-024			AWX-212	Composition assembly (Function switch ass'y + Tone control ass'y)
		7.	ABN-028				
		8.	ABA-261				
		9.	GWX-661				
		10.	ASX-203				
			Remote slide switch (REC OUT SELECTOR)	101.			Frame
⚠	★★	11.	ASG-521	102.			Flexible joint
		12.	.....	103.			Panel stay
		13.	AEC-818	104.			Mounting plate
	★★	14.	2SC2579/A/-O* (2SC2579/A/-Y*)	105.			Holder
	★★	15.	2SA1104/A/-O* (2SA1104/A/-Y*)				
			*hfe should have the same value.	106.			Tone control assembly
				107.			Shielding case
				108.			Wire clip
				109.			Headphones jack assembly
				110.			Function switch assembly
⚠	★★	16.	ABA-258				
		17.	AEK-101	111.			Volume assembly
		18.	GWK-180	112.			Loudness assembly
⚠		19.	ACG-019	113.			P.C. Board spacer
		20.	AEC-510	114.			Right frame
				115.			Heat sink
		21.	ABA-252				
⚠		22.	AKP-041	116.			Rear panel
		23.	BBT30P080FZK	117.			Terminal (GND)

Rear Panel View

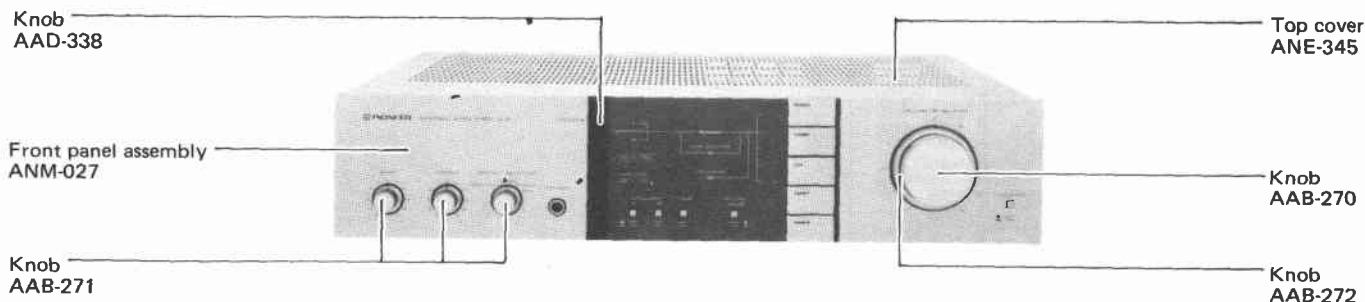


5. PARTS LOCATION

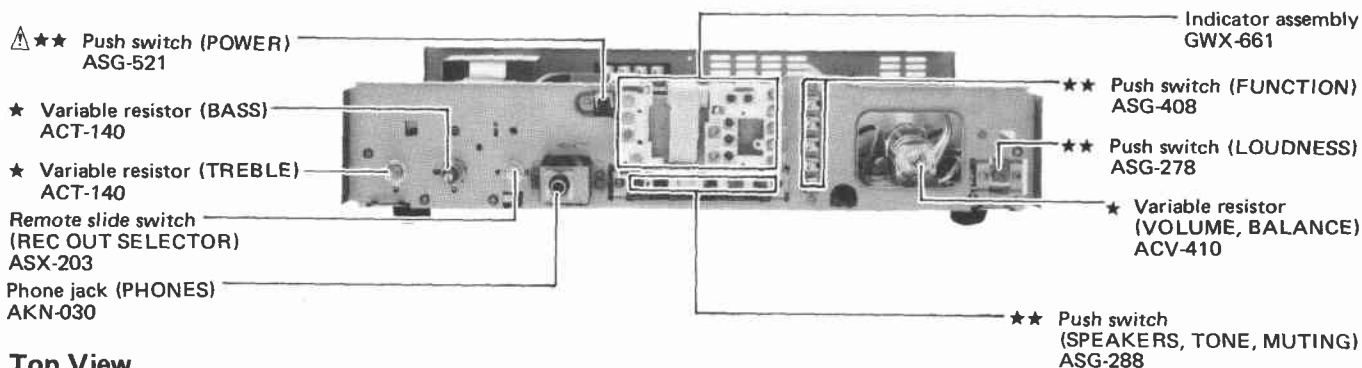
NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks $\star\star$ and \star .
 $\star\star$ GENERALLY MOVES FASTER THAN \star .
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

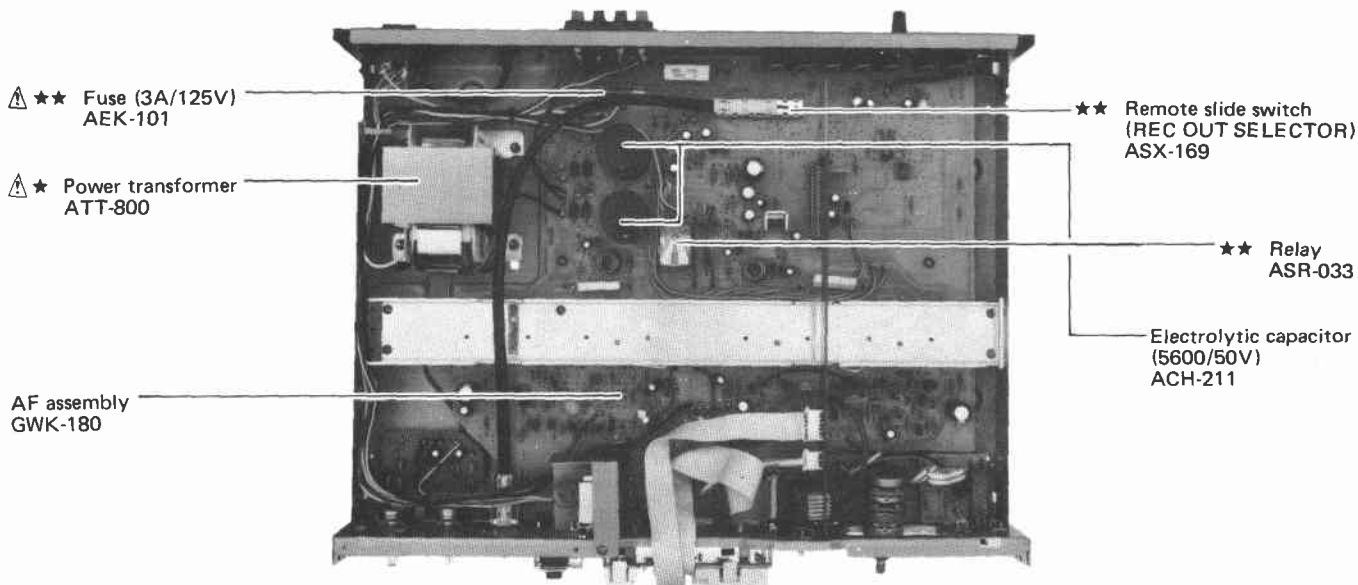
Front Panel View



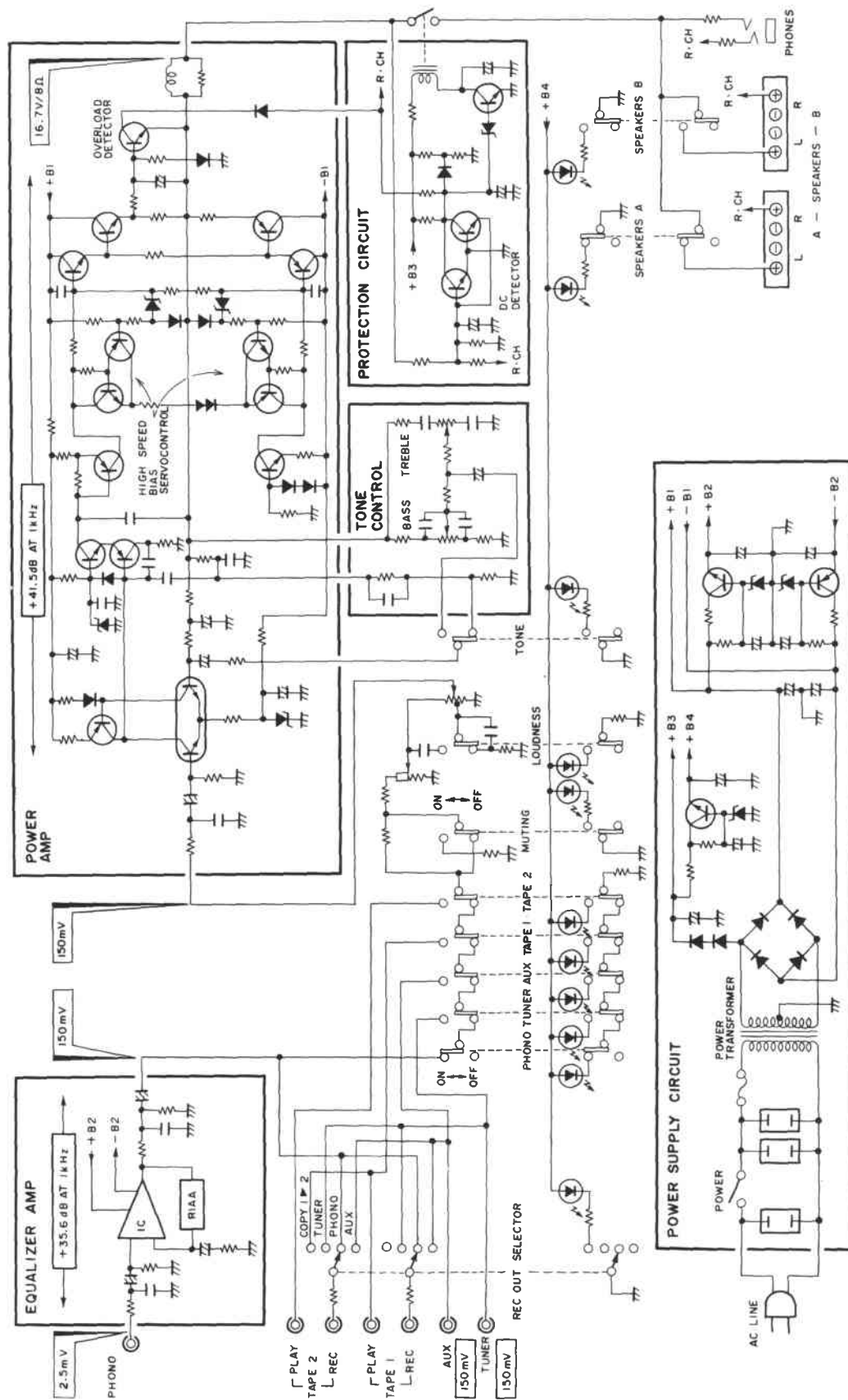
Front View with Panel Removed



Top View



4. BLOCK DIAGRAM



9. ELECTRICAL PARTS LIST

NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10¹ 561 RD¼PS 561 J
 47kΩ 47 × 10³ 473 RD¼PS 473 J
 0.5Ω 0R5 RN2H 0R5 K
 1Ω 010 RS1P 010 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 100 5621 RN¼SR 5621 F

- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★.
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Part No.	Symbol & Description	Mark	Part No.	Symbol & Description
Δ ★	ATT-800	T1 Power transformer		CEA 471M 6L	C501
Δ ★★	AEK-101	FU1 Fuse (3A/125V)		CEA R47M 50L	C503
Δ ★★	ASG-521	S1 Push switch (POWER)		CEANL 010M 50	C13, C14
Δ	ACG-019	C1 Ceramic capacitor (0.01/AC150V)		CEANL 2R2M 50	C419, C420
	CKDYF 223Z 50	C901		CEANL 4R7M 50	C3, C4, C409, C410
★★	2SC2579/A/-O*	Q1, Q2			
★★	(2SC2579/A/-Y*)			CCDSL 150J 50	C405, C406
★★	2SA1104/A/-O*	Q3, Q4	Δ	CCDSL 151K 500	C427-C430
★★	(2SA1104/A/-Y*)			CCDSL 100D 50	C431, C432
	*hfe of Q1-Q4 should have the same value.			CCDSL 560J 50	C421, C422
				CCDSL 820J 50	C403, C404
	AKE-051	Terminal (SPEAKERS)			
Δ	AKP-041	AC socket (AC OUTLETS)		CCDSL 561J 50	C401, C402
Δ	ADG-052	AC power cord		CQMA 392K 50	C11, C12
	GWK-180	AF assembly		CQMA 562K 50	C7, C8
	GWX-661	Indicator assembly			
				CQMA 152K 50	C9, C10
	AWX-212	Composition assembly (Function switch ass'y + Tone control ass'y)		CQMA 183J 50	C411-C414
				ACH-356	C504, C505 Electrolytic (0.47/50V)

AF Assembly (GWK-180)

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDSL 221J 50	C1, C2, C423-C426
	ACH-211	C703, C704 Electrolytic (5600/50V)
Δ	ACG-019	C708 Ceramic (0.01/AC150V)
Δ	ACG-017	C709 Ceramic (0.01/AC125V)
	CEA 101M 10L	C5, C6, C415, C416, C706
	CEA 101M 25L	C502, C710
	CEA 221M 50L	C707
	CEA 470M 10L	C705
	CEA 470M 25L	C407, C408, C701, C702, C711, C712
	CEA 331M 50L	C417, C418
	CEA 100M 50	C301, C302

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	C92-063	VR1, VR2 Semifixed (100-B)
	RD¼PM □□□ J	R1-R27, R401-R406, R413-R416, R419, R420, R429-R440, R445-R452, R501-R503, R505, R509-R512, R703, R704, R706 R705 Wire wound (270/5W) R443, R444 Wire wound (0.22+0.22/2W)
	ACN-045	
	ACN-070	

Mark	Part No.	Symbol & Description	Mark	Part No.	Symbol & Description
⚠	RS1P□□□ J	R465, R466, R504	★	MZ-047	D710
⚠	RD¼PMF □□□ J	R201, R407—R412, R417, R418, R421, R422, R425—R428, R453—R460, R701, R702, R707	★	1S2473	D411—D414
⚠	RD¼PSF □□□ J	R441, R442, R461—R464, R506—R508	★	STV2H	D409, D410
			★	10E2	D708, D709
			★	GP-20D	D704—D707
			TH103-2		TH1, TH2

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DX (μPC4558C-P)	Q1
★★	2SC1400-E* (2SC1400-U*) (2SC2603/A/-E*) (2SC2603/A/-F*)	Q411, Q412, Q417, Q418
★★	2SA750-E* (2SA750-U*) (2SA1115/A/-E*) (2SA1115/A/-F*) *hfe of Q411—Q418 should have the same value.	Q413—Q416
★★	2SA733A (2SA1100)	Q701
★★	2SC945A (2SC2575)	Q503, Q504, Q702
★★	2SC1735-C* (2SC1735-D*)	Q419, Q420
★★	2SA850-C* (2SA850-D*) *hfe of Q419—Q422 should have the same value.	Q421, Q422
★★	2SA1015 (2SA733A)	Q403, Q404
★★	2SA1015-Y* (2SA1015-GR*)	Q405, Q406
★★	2SC1815-Y* (2SC1815-GR*) *hfe of Q405—Q408 should have the same value.	Q407, Q408
★★	2SA905	Q409, Q410
★★	2SC1384	Q505
★★	2SC1914A	Q501, Q502
★★	2SC2259	Q401, Q402
★★	2SD313 (2SD880)	Q703
★★	2SC1915	Q423, Q424
★	1S2473 (1S1555) (1S2076)	D401, D402, D405—D408, D419, D420, D501—D505
★	MZ-230 (WZ-230)	D701
★	MZ-157 (WZ-157)	D506, D702, D703
★	05Z3R0	D415—D418
★	MZ-100 (WZ-100)	D403, D404

OTHERS

Mark	Part No.	Symbol & Description
★★	ASX-169	S1 Remote slide switch (REC OUT SELECTOR)
★★	ASG-288	S2 Push switch (SPEAKERS, TONE, MUTING)
	AKB-078	Terminal (TAPE1, 2)
	AKB-079	Terminal (INPUT)
★★	ASR-033	RL1 Relay
	VBZ30P080FMC	Screw 3x8

Volume Assembly

Mark	Part No.	Symbol & Description
★★	ACV-410	VR3 Variable resistor (VOLUME/BALANCE)

Headphones Jack Assembly

Mark	Part No.	Symbol & Description
	AKN-030	Phones jack (PHONES)

Loudness Assembly

Mark	Part No.	Symbol & Description
	CQMA 563K 50	C101, C102
	CCDSL 221J 50	C103, C104
	RD¼PM123J	R101, R102
	RD¼PM101J	R105
★★	ASG-278	S3 Push switch (LOUDNESS)

Indicator Assembly (GWX-661)

Mark	Part No.	Symbol & Description
	RD¼PM431J	R201
	RD¼PM101J	R202
★	AEL-346	D201—D207, D209—D211
★	AEL-324	D208

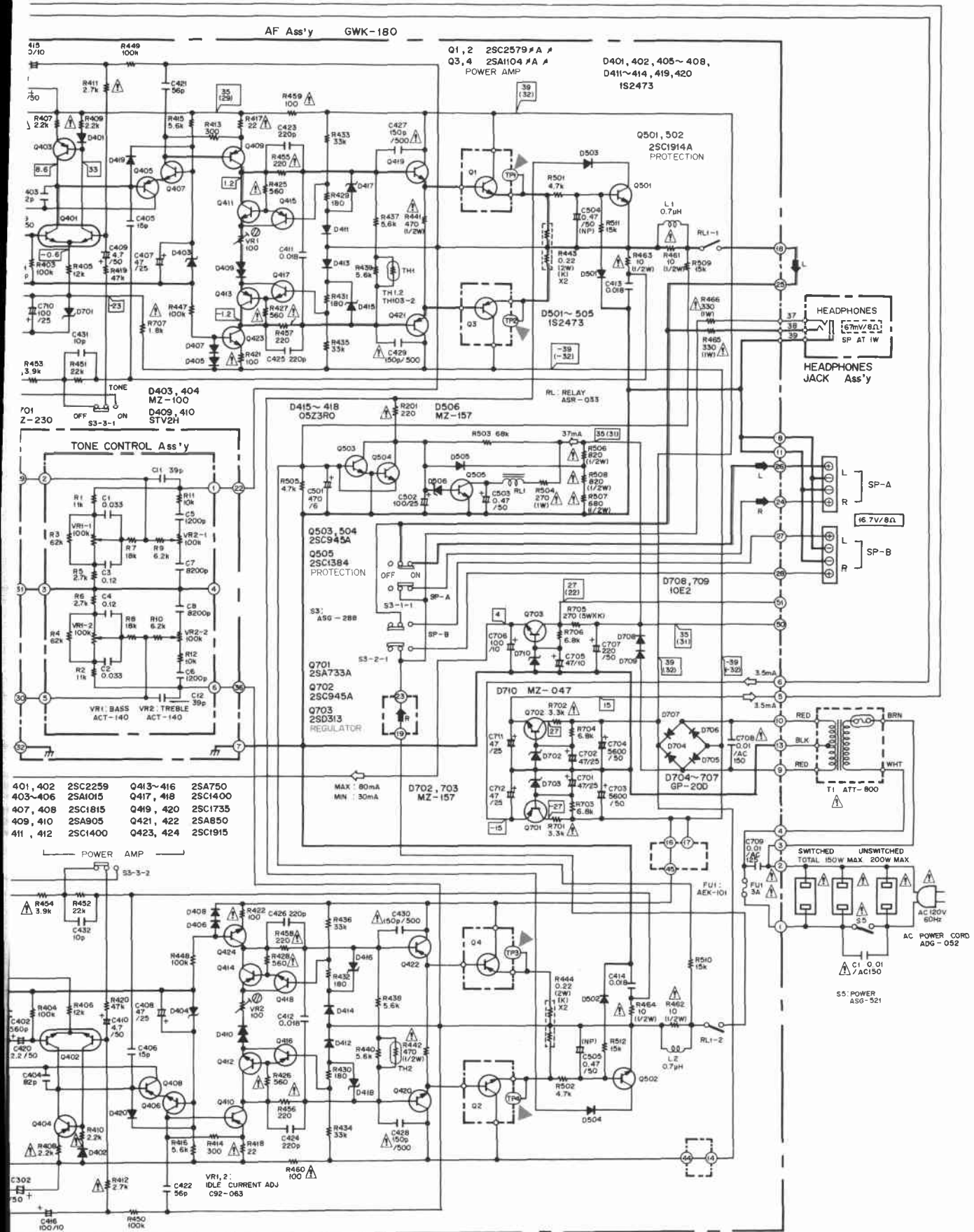
4

5

6

NOTE:

The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



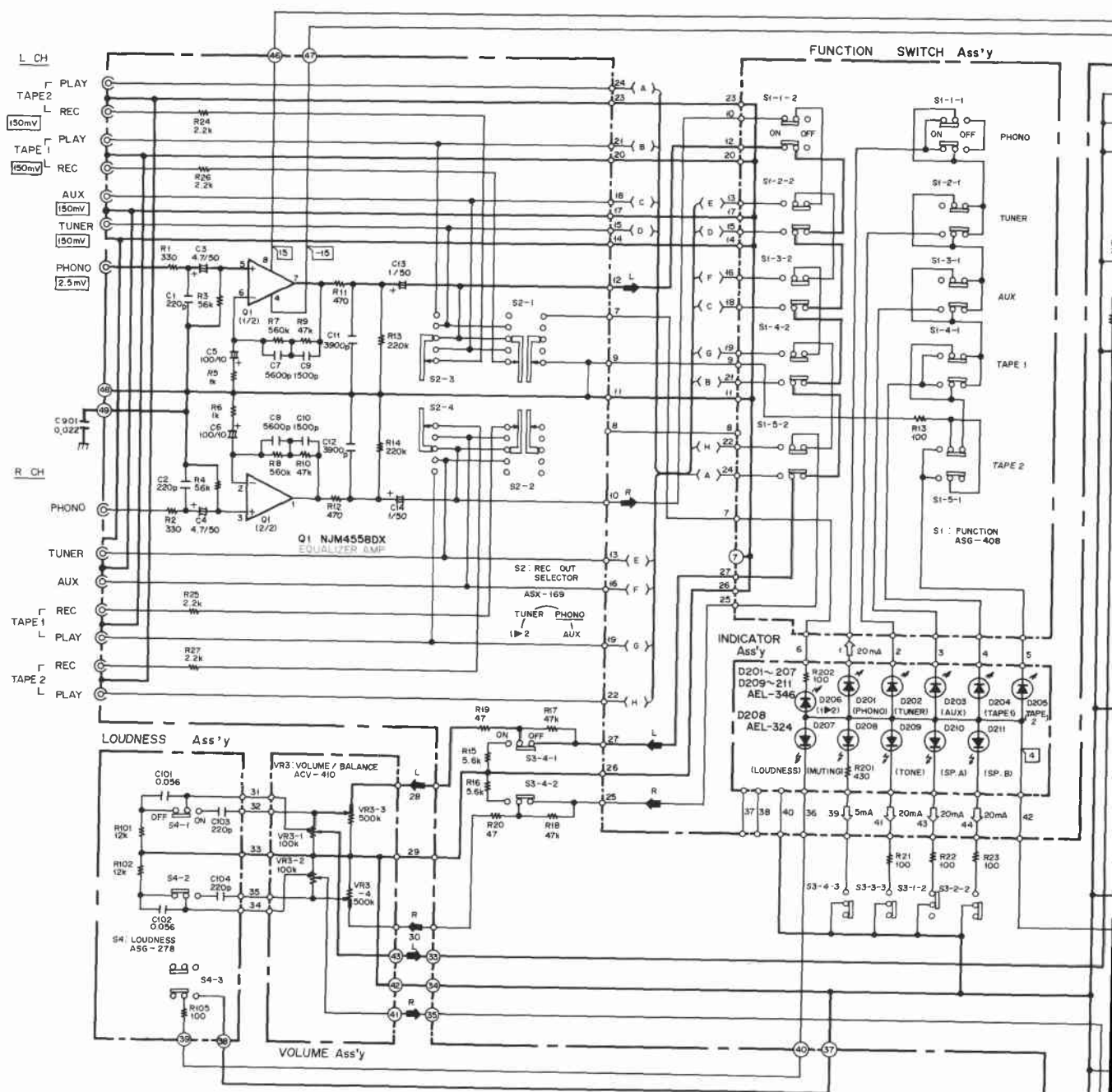
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6

14

8. SCHEMATIC DIAGRAM



1. RESISTORS:
Indicated in Ω , $\frac{1}{2}W$, $\pm 5\%$ tolerance unless otherwise noted k : k Ω , M : M Ω , (F) : $\pm 1\%$, (G) : $\pm 2\%$, (K) : $\pm 10\%$, (M) : $\pm 20\%$ tolerance.

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
Signal voltage at 35 W + 35 W 8 Ω output (1kHz)
DC voltage (V) at no input signal
Value in () is DC voltage at rated power.
mA : DC current at no input signal

4. OTHERS:
Signal route.
Adjusting point.
The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SWITCHES:

S1-1 : FUNCTION (PHONO)	ON - OFF
S1-2 : FUNCTION (TUNER)	ON - OFF
S1-3 : FUNCTION (AUX)	ON - OFF
S1-4 : FUNCTION (TAPE 1)	ON - OFF
S1-5 : FUNCTION (TAPE 2)	ON - OFF
S2 : REC OUT SELECTOR	
COPY 1-2 - TUNER - PHONO - AUX	
S3-1 : SPEAKER (A)	ON - OFF
S3-2 : SPEAKER (B)	ON - OFF
S3-3 : TONE	ON - OFF
S3-4 : MUTING (-20dB)	ON - OFF
S4 : LOUDNESS	ON - OFF
S5 : POWER	ON - OFF

The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

Function Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASG-408 RD¼PM101J	S1 Push switch (FUNCTION) R13

Tone Control Assembly

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 333K 50	C1, C2
	CQMA 122K 50	C5, C6
	CQMA 124K 50	C3, C4
	CQMA 822K 50	C7, C8
	CCDSL 390J 50	C11, C12

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACT-140	VR1 Variable (100k-B, BASS)
★	ACT-140	VR2 Variable (100k-B, TREBLE)
	RD¼PM □□□ J	R1--R12

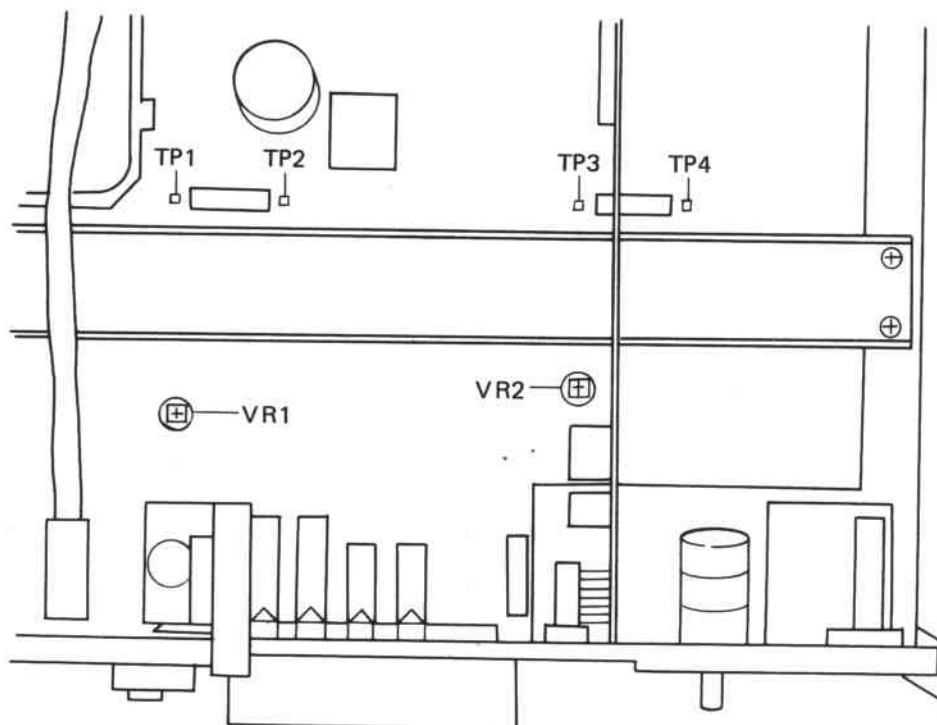
10. AJUSTE

Ajuste de la corriente la corriente devatiada

- Girar la VR1 (L, izquierda) VR2 (R, derecha) totalmente en la dirección hacia la izquierda.
- Sin ninguna carga o señal de entrada, girar el interruptor de la alimentación (POWER) a ON y manténgalo por 10 minutos.

Punto de ajuste	Valor determinado	Terminal de medida
VR1 (L)	$31 \text{ mV} \pm 13 \text{ mV}$	TP1 (+) y TP2 (-)
VR2 (R)	$31 \text{ mV} \pm 13 \text{ mV}$	TP4 (+) y TP3 (-)

Extraer la tapa



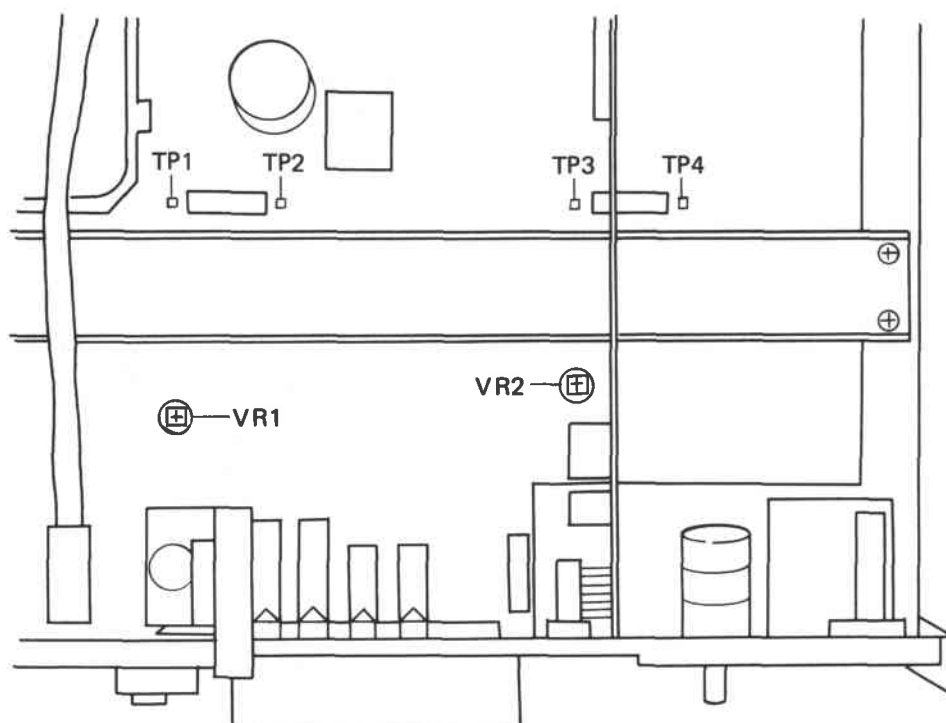
10. RÉGLAGE

Réglage du courant déwatté

- Tourner à fond VR1 (L, gauche) et VR2 (R, droite) en sens inverse des aiguilles d'une montre.
- Sans charge ni signal d'entrée, allumer l'interrupteur POWER et le maintenir 10 minutes.

Point de réglage	Valeur prescrite	Terminal de mesure
VR1 (L)	31 mV \pm 13 mV	TP1 (+) et TP2 (-)
VR2 (R)	31 mV \pm 13 mV	TP4 (+) et TP3 (-)

Enlever le couvercle



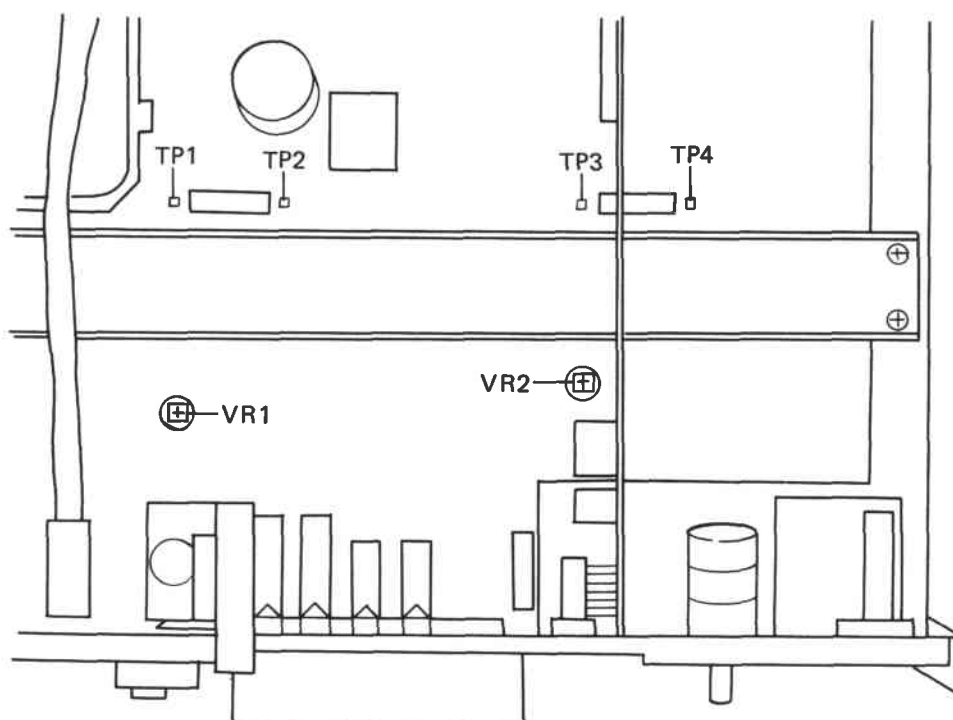
10. ADJUSTMENTS

Idle Current Adjustment

- Turn VR1 (L) and VR2 (R) fully around in the counter-clockwise direction.
- Without any load or input signal, turn to POWER switch ON and let stand for 10 minutes.

Adjustment point	Prescribed value	Measuring terminal
VR1 (L)	$31\text{mV} \pm 13\text{mV}$	TP1(+) and TP2(-)
VR2 (R)	$31\text{mV} \pm 13\text{mV}$	TP4(+) and TP3(-)

- Remove the top cover



ADDITIONAL

PIONEER®

Service Manual

**ORDER NO.
ART-621-0**

NON SWITCHING AMP
STEREO AMPLIFIER

A-5 HE, HB

- The basic performance of the HE and HB types is the same as the KU type, please refer to the KU type service manual (ART-620) with the exception of this supplements.

SPECIFICATIONS

The specifications for HE and HB types are the same as the KU type except for following sections:

Amplifier Section

Hum and Noise (DIN, continuous Power/50mW)

PHONO.....72dB/64dB

TUNER, AUX, TAPE PLAY.....95dB/69dB

Miscellaneous

Power Requirements220V/240V (Switchable)

50/60Hz

Power Consumption250W

Line Voltage Selection

Line voltage can be changed with following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Take out the fuse (AEK-018) from the fuse assembly.
4. Re-install the fuse in the correct voltage indication (see Fig. 1).
5. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label

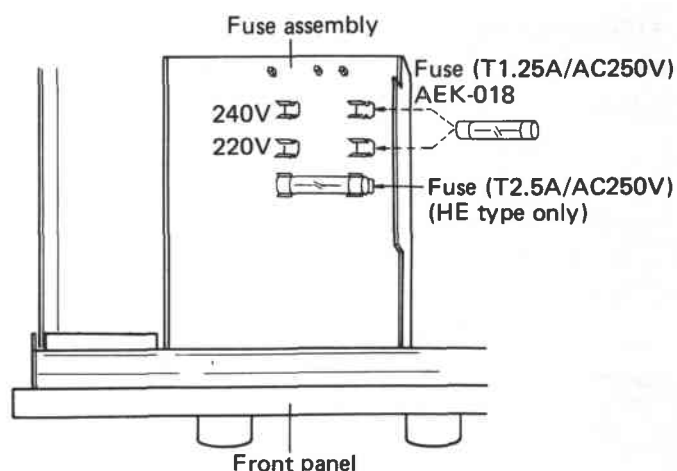


Fig. 1


PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

Y L © APR. 1981

Printed in Japan

CONTRAST OF MISCELLANEOUS PARTS










NOTES:

- Parts without part number cannot be supplied.
- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★.
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

P.C. BOARD ASSEMBLY

Mark	Symbol & Description	Part No.			Remarks
		KU type	HE type	HB type	
	AF assembly	GWK-180	GWK-182	GWK-182	

ELECTRICAL PARTS

Mark	Symbol & Description	Part No.			Remarks
		KU type	HE type	HB type	
 ★	T1 Power transformer (120V)	ATT-800	
 ★	T1 Power transformer (220V, 240V)	.....	ATT-802	ATT-802
 ★★	FU1 Fuse (3A)	AEK-101	.....	.....
 ★★	FU1 Fuse (T1.25A/AC250V)	.....	AEK-018	AEK-018
 ★★	FU2 Fuse (T2.5A/AC250V)	.....	AEK-403	.....
 ★★	S1 Push switch (POWER)	ASG-521	ASG-522	ASG-522	
 ★★	C1 Ceramic capacitor (0.01/AC150V)	ACG-019	.....	.....
 ★★	AC socket (AC OUTLETS)	AKP-041	AKP-026	AKP-044	
 ★★	AC power cord	ADG-052	ADG-041	ADG-051	

FURNISHED PARTS

Mark	Symbol & Description	Part No.			Remarks
		KU type	HE type	HB type	
	Operating instructions (English)	ARB-416	.....	ARB-423	
	Operating instructions (English, French, German, Italian)	.....	ARD-169	.....

Parts List of AF Assembly (GWK-182)

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDSL 221J 50 ACH-211	C1, C2, C423—C426 C703, C704 Electrolytic (5600/50V)
⚠	ACG-019 CEA 101M 10L CEA 101M 25L	C708 Ceramic (0.01/AC150V) C5, C6, C415, C416, C706 C502, C710
	CEA 221M 50L CEA 470M 10L CEA 470M 25L	C707 C705 C407, C408, C701, C702, C711, C712
	CEA 331M 50L CEA 471M 6L	C417, C418 C501
	CEA R47M 50L CEANL 010M 50L CEANL 2R2M 50L CEANL 4R7M 50L CCDSL 150J 50	C503—C505 C13, C14 C419, C420 C3, C4, C409, C410 C405, C406
⚠	CCDSL 151K 500 CCDSL 100D 50 CCDSL 560J 50 CCDSL 820J 50 CCDSL 561J 50	C427—C430 C431, C432 C421, C422 C403, C404 C401, C402
	CQMA 392K 50 CQMA 562K 50 CQMA 152K 50 CQMA 183J 50 CEA 100M 50	C11, C12 C7, C8 C9, C10 C411—C414 C301, C302

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	C92-063	VR1, VR2 Semifixed (100-B)
	RD%PM□□□J	R1—R27, R401—R406, R413—R416 R419, R420, R429—R440, R445— R452, R501—R503, R505, R509— R512, R703, R704, R706
	ACN-045 ACN-070	R705 Wire wound (270/5W) R443, R444 Wire wound (0.22 + 0.22/2W)
⚠	RD%PMF□□□J RS1P□□□J	R412, R453, R454 R465, R466, R504
⚠	RD%PMFL□□□J	R201, R407—R411, R417, R418, R421, R422, R425—R428, R455— R460, R701, R702, R707
⚠	RD%PSF□□□J	R441, R442, R461—R464, R506— R508

SEMICONDUCTORS

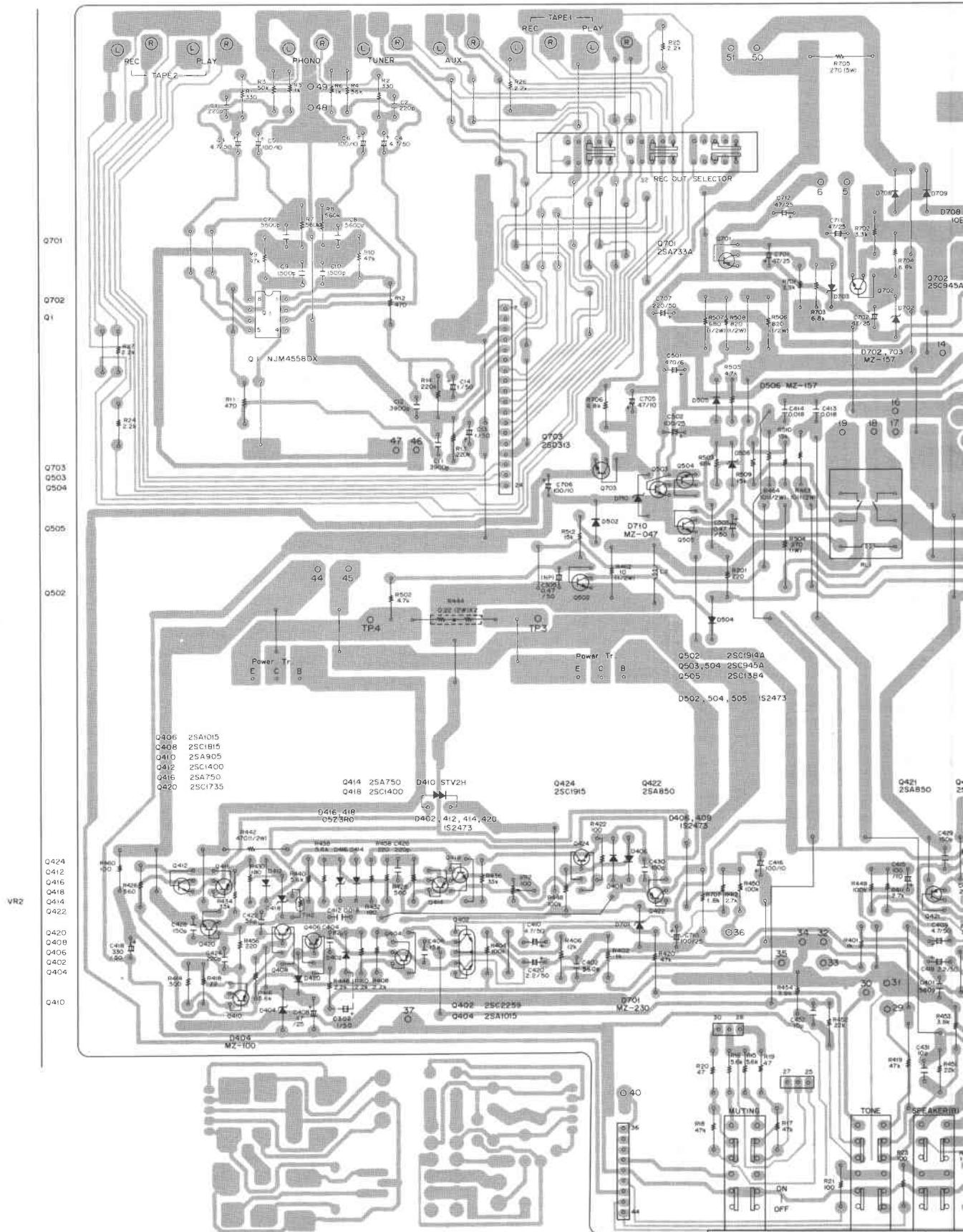
Mark	Part No.	Symbol & Description
★★	NJM4558DX (μPC4558C-P)	Q1

Mark	Part No.	Symbol & Description
★★	2SC1400-E* (2SC1400-U*) (2SC2603/A/-E*) (2SC2603/A/-F*)	Q411, Q412, Q417, Q418
★★	2SA750-E* (2SA750-U*) (2SA1115/A/-E*) (2SA1115/A/-F*) *hfe of Q411—Q418 should have the same value.	Q413—Q416
★★	2SA733A (2SA1100)	Q701
★★	2SC945A (2SC2575)	Q503, Q504, Q702
★★	2SC1735-C* (2SC1735-D*)	Q419, Q420
★★	2SA850-C* (2SA850-D*) *hfe of Q419—Q422 should have the same value.	Q421, Q422
★★	2SA1015 (2SA733A)	Q403, Q404
★★	2SA1015-Y* (2SA1015-GR*)	Q405, Q406
★★	2SC1815-Y* (2SC1815-GR*) *hfe of Q405—Q408 should have the same value.	Q407, Q408
★★	2SA905	
★★	2SC1384	Q505
★★	2SC1914A	Q501, Q502
★★	2SC2259	Q401, Q402
★★	2SD313 (2SD880)	Q703
★★	2SC1915	Q423, Q424
★	1S2473 (1S1555) (1S2076)	D401, D402, D405—D408, D419, D420, D501—D505
★	MZ-230 (WZ-230)	D701
★	MZ-157 (WZ-157)	D506, D702, D703
★	05Z3R0	D415—D418
★	MZ-100 (WZ-100)	D403, D404
★	MZ-047	D710
★	1S2473	D411—D414
★	STV2H	D409, D410
★	10E2	D708, D709
★	GP-200	D704—D707
	TH103-2	TH1, TH2

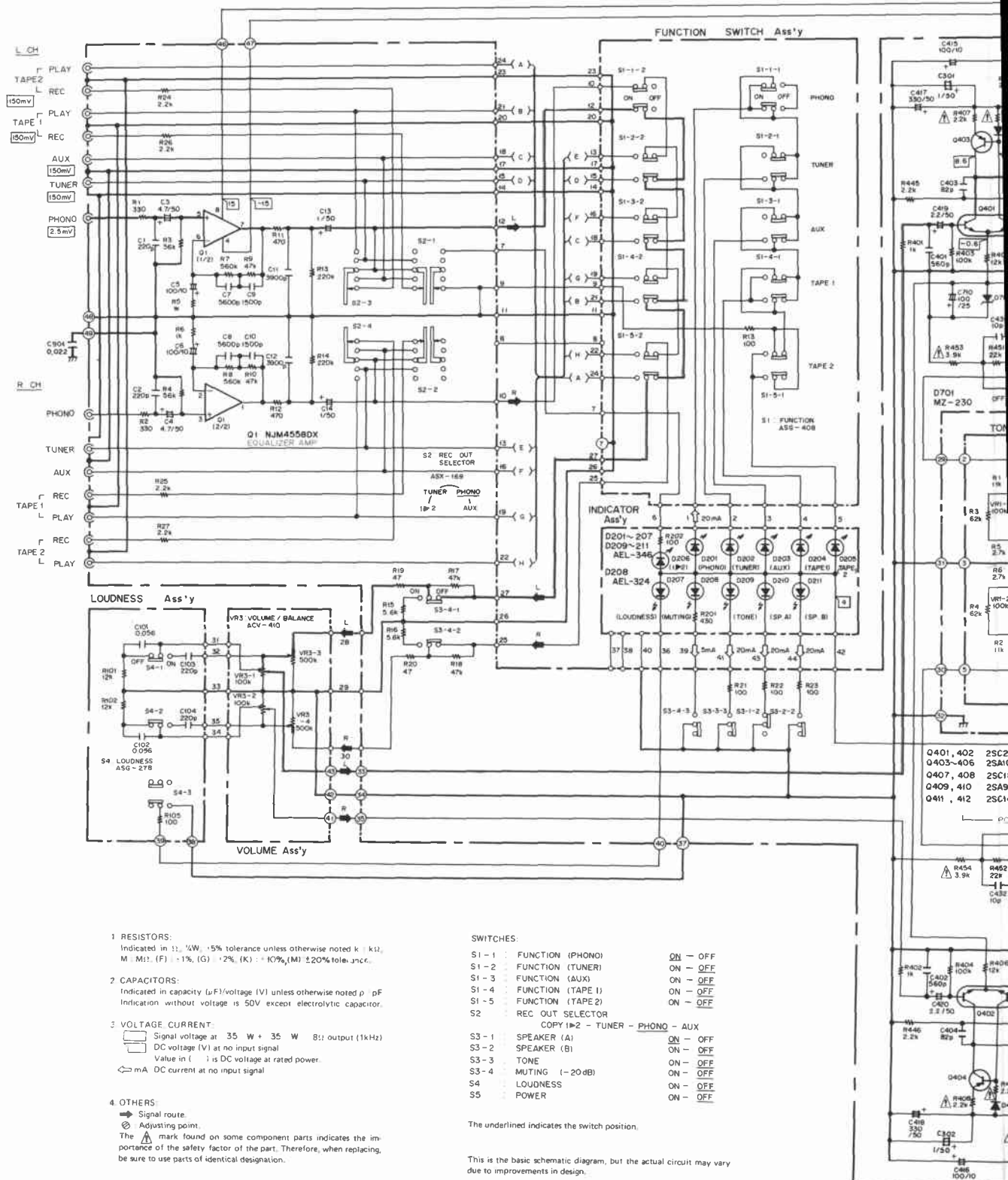
Parts List of Fuse Assembly

Mark	Part No.	Symbol & Description
⚠	ACG-001	C1 Ceramic capacitor (0.01/AC250V)

AF Assembly (GWK-182)

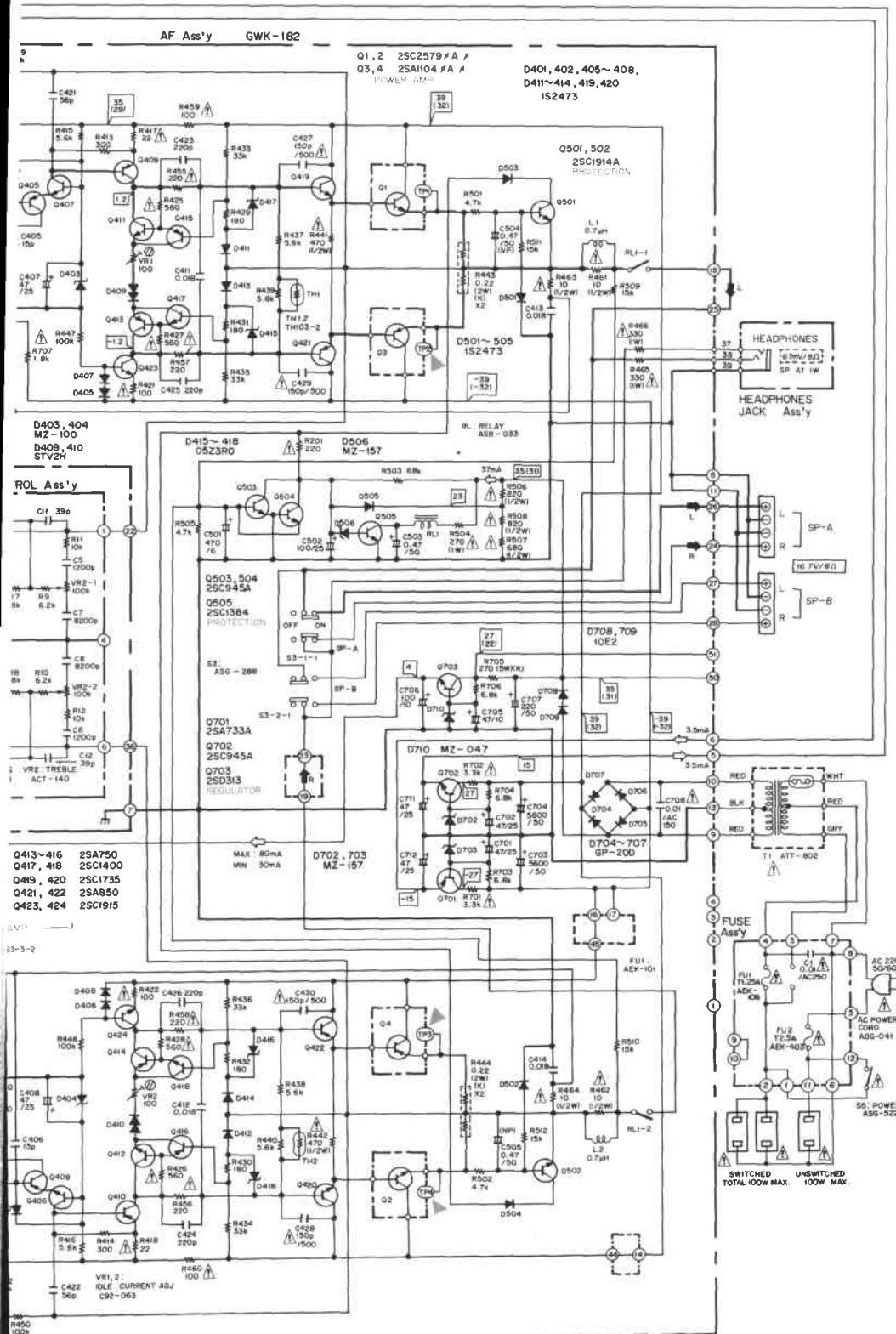


SCHEMATIC DIAGRAM



NOTE:

The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



A

B

C

D

2. CONTRAST OF MISCELLANEOUS PARTS

- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

P.C. BOARD ASSEMBLIES

Symbol	Description	Part No.		
		KU type	HB type	HE type
	AF amplifier assembly	GWK-143	GWK-154	GWK-154
	Tone control assembly	GWG-137	GWG-144	GWG-144
	Switch assembly (A)	GWS-212	GWS-238	GWS-238
	Switch assembly (B)	GWS-213	GWS-239	GWS-239
	Volume assembly	GWX-457	GWX-492	GWX-492
	Headphone assembly	GWX-458	GWX-493	GWX-493
	Fuse assembly	.....	GWX-494	GWX-494

OTHERS

Symbol	Description	Part No.		
		KU type	HB type	HE type
	Front panel assembly	ANB-848	ANB-896	ANB-896
Δ T1	Power transformer	ATT-666	ATT-705	ATT-705
Δ FU1	Fuse (3A)	AEK-101	.....	.....
Δ FU1	Fuse (1A)	.....	AEK-402	AEK-402
Δ FU2,3	Fuse (2.5A)	.....	AEK-403	AEK-403
Δ FU4	Fuse (2.5A)	.....	.....	AEK-403
Δ S6	Lever switch (POWER)	ASK-520	ASK-521	ASK-521
Δ C1	Ceramic capacitor 0.01/250V	ACG-001	.....	.....
Δ	AC socket	AKP-032	AKP-044	AKP-026
Δ	AC power cord	ADG-023	ADG-051	ADG-041
	Screw	ABA-145	ABA-116	ABA-116

PACKING AND FURNISHED PARTS

Symbol	Description	Part No.		
		KU type	HB type	HE type
	Operating instructions (ENGLISH)	ARB-352	ARB-366	ARB-366
	Operating instructions (GERMAN/FRENCH)	.....	.....	ARD-148
	Packing case	AHD-749	AHD-776	AHD-776

5. PARTS LIST OF P.C. BOARD ASSEMBLIES

AF AMP Assembly (GWK-154)

SWITCHES AND TRANSFORMER

Part No.	Symbol & Description
ASX-115	S1 Remote slide-switch (FUNCTION)
ASK-172	S2 Lever switch (TAPE 2)
ASK-171	S3, S4 Lever switch (SUBSONIC, LOUDNESS)
ATT-577	T2 Heater transformer

CAPACITORS

Part No.	Symbol & Description
CCDSL 101J 50	C1, C2
ACH-224	C52, C53 Electrolytic 8000/42V
CEA 220M 50L	C51
CEA 220M 35L	C57
CEA 470M 10L	C33, C34
CEA 101M 10L	C83, C84
CEA 102M 50L	C54
CEA 101M 50L	C55, C60, C61
CEA 101M 35L	C56
CEANL 2R2M 50	C25, C26
CEANL 100M 16	C3, C4
CEANL R33M 50	C75, C76
CEA 470M 50L	C77, C82
CCDSL 030C 50	C37, C38
CCDSL 100K 500	C41, C42
CCDSL 220J 50	C7, C8
CCDSL 470J 50	C5, C6, C21, C22, C29-C32
CCDSL 560J 50	C15, C16, C27, C28
CCDSL 820J 50	C35, C36
CCDSL 181K 500	C43-C46
CEA 221M 10L	C17, C18
CKDYF 223Z 50	C39, C40, C89, C90
CKDYX 473M 25	C78-C81
CKDYA 102J 50	C85-C88
CQMA 473K 50	C47, C48
CKDYA 122J 50	C11, C12
CQMA 183J 50	C9, C10
CQMA 563J 50	C23, C24
CQMA 683J 50	C13, C14
CEANL R47M 50	C19, C20
△ ACG-004	C58 Ceramic 0.01/150V

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

RESISTOR

Part No.	Symbol & Description
ACT-130	VR1 Variable 500k (BALANCE)
ACN-070	R65, R66 Wire wound 0.22/2Wx2
RS1P □□□ J	R74
△ RS1P □□□ J	R102
RD½PS □□□ J	R63, R64, R67, R68
△ RD½PSF □□□ J	R71, R72, R76, R80
RN¼PQ □□□ F	R11, R12, R15, R16
△ RD½PMF □□□ J	R19, R20, R51, R52, R55-R62, R70, R75, R103, R104, R113
RD½PM □□□ J	R1-R10, R13, R14, R17, R18, R21-R50, R53, R54, R69, R73, R77-R79, R91-R95, R105, R106, R108-R112

SEMICONDUCTORS

Part No.	Symbol & Description
2SC2602	Q1, Q2
2SA872A	Q11, Q12
2SA798	Q7, Q8
2SA850-D*	Q17, Q18
(2SA850-C*)	
2SC1735-D*	Q15, Q16
(2SC1735-C*)	
* hfe of Q15-Q18 should have the same rank	
2SC1919	Q3, Q4
2SC1815	Q5, Q6
2SC1775A	Q9, Q10, Q13, Q14
2SC1384	Q23, Q24
2SD880	Q25
2SC1885	Q26
1S2076	D1-D4, D18, D19
(1S1555)	
△ 30D2	D11-D14
△ 10E2	D9, D10
(S1B01-02)	
1S2473	D5, D6
MZ-230	D20
MZ-192	D17
(WZ-192)	
MZ-250	D16
STV3H	D7, D8

OTHERS

Part No.	Symbol & Description
AKB-063	Terminal (TAPE)
AKB-064	Terminal (INPUT)

5. PARTS LIST OF P.C. BOARD ASSEMBLIES

AF AMP Assembly (GWK-154)

SWITCHES AND TRANSFORMER

Part No.	Symbol & Description	
ASX-115	S1	Remote slide-switch (FUNCTION)
ASK-172	S2	Lever switch (TAPE 2)
ASK-171	S3, S4	Lever switch (SUBSONIC, LOUDNESS)
ATT-577	T2	Heater transformer

CAPACITORS

Part No.	Symbol & Description	
CCDSL 101J 50	C1, C2	
ACH-224	C52, C53	Electrolytic 8000/42V
CEA 220M 50L	C51	
CEA 220M 35L	C57	
CEA 470M 10L	C33, C34	
CEA 101M 10L	C83, C84	
CEA 102M 50L	C54	
CEA 101M 50L	C55, C60, C61	
CEA 101M 35L	C56	
CEANL 2R2M 50	C25, C26	
CEANL 100M 16	C3, C4	
CEANL R33M 50	C75, C76	
CEA 470M 50L	C77, C82	
CCDSL 030C 50	C37, C38	
CCDSL 100K 500	C41, C42	
CCDSL 220J 50	C7, C8	
CCDSL 470J 50	C5, C6, C21, C22, C29-C32	
CCDSL 560J 50	C15, C16, C27, C28	
CCDSL 820J 50	C35, C36	
CCDSL 181K 500	C43-C46	
CEA 221M 10L	C17, C18	
CKDYF 223Z 50	C39, C40, C89, C90	
CKDYX 473M 25	C78-C81	
CKDYA 102J 50	C85-C88	
CQMA 473K 50	C47, C48	
CKDYA 122J 50	C11, C12	
CQMA 183J 50	C9, C10	
CQMA 563J 50	C23, C24	
CQMA 683J 50	C13, C14	
CEANL R47M 50	C19, C20	
△ ACG-004	C58	Ceramic 0.01/150V

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

RESISTOR

Part No.	Symbol & Description	
ACT-130	VR1	Variable 500k (BALANCE)
ACN-070	R65, R66	Wire wound 0.22/2Wx2
RS1P □□□ J	R74	
△ RS1P □□□ J	R102	
RD½PS □□□ J	R63, R64, R67, R68	
△ RD½PSF □□□ J	R71, R72, R76, R80	
RN¼PQ □□□ F	R11, R12, R15, R16	
△ RD¼PMF □□□ J	R19, R20, R51, R52, R55-R62, R70, R75, R103, R104, R113	
RD¼PM □□□ J	R1-R10, R13, R14, R17, R18, R21-R50, R53, R54, R69, R73, R77-R79, R91-R95, R105, R106, R108-R112	

SEMICONDUCTORS

Part No.	Symbol & Description	
2SC2602	Q1, Q2	
2SA872A	Q11, Q12	
2SA798	Q7, Q8	
2SA850-D*	Q17, Q18	
(2SA850-C*)		
2SC1735-D*	Q15, Q16	
(2SC1735-C*)		
* hfe of Q15-Q18 should have the same rank		
2SC1919	Q3, Q4	
2SC1815	Q5, Q6	
2SC1775A	Q9, Q10, Q13, Q14	
2SC1384	Q23, Q24	
2SD880	Q25	
2SC1885	Q26	
1S2076	D1-D4, D18, D19	
(1S1555)		
△ 30D2	D11-D14	
△ 10E2	D9, D10	
(S1B01-02)		
1S2473	D5, D6	
MZ-230	D20	
MZ-192	D17	
(WZ-192)		
MZ-250	D16	
STV3H	D7, D8	

OTHERS

Part No.	Symbol & Description	
AKB-063	Terminal (TAPE)	
AKB-064	Terminal (INPUT)	

2. CONTRAST OF MISCELLANEOUS PARTS

- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

P.C. BOARD ASSEMBLIES

Symbol	Description	Part No.		
		KU type	HB type	HE type
	AF amplifier assembly	GWK-143	GWK-154	GWK-154
	Tone control assembly	GWG-137	GWG-144	GWG-144
	Switch assembly (A)	GWS-212	GWS-238	GWS-238
	Switch assembly (B)	GWS-213	GWS-239	GWS-239
	Volume assembly	GWX-457	GWX-492	GWX-492
	Headphone assembly	GWX-458	GWX-493	GWX-493
	Fuse assembly	.....	GWX-494	GWX-494

OTHERS

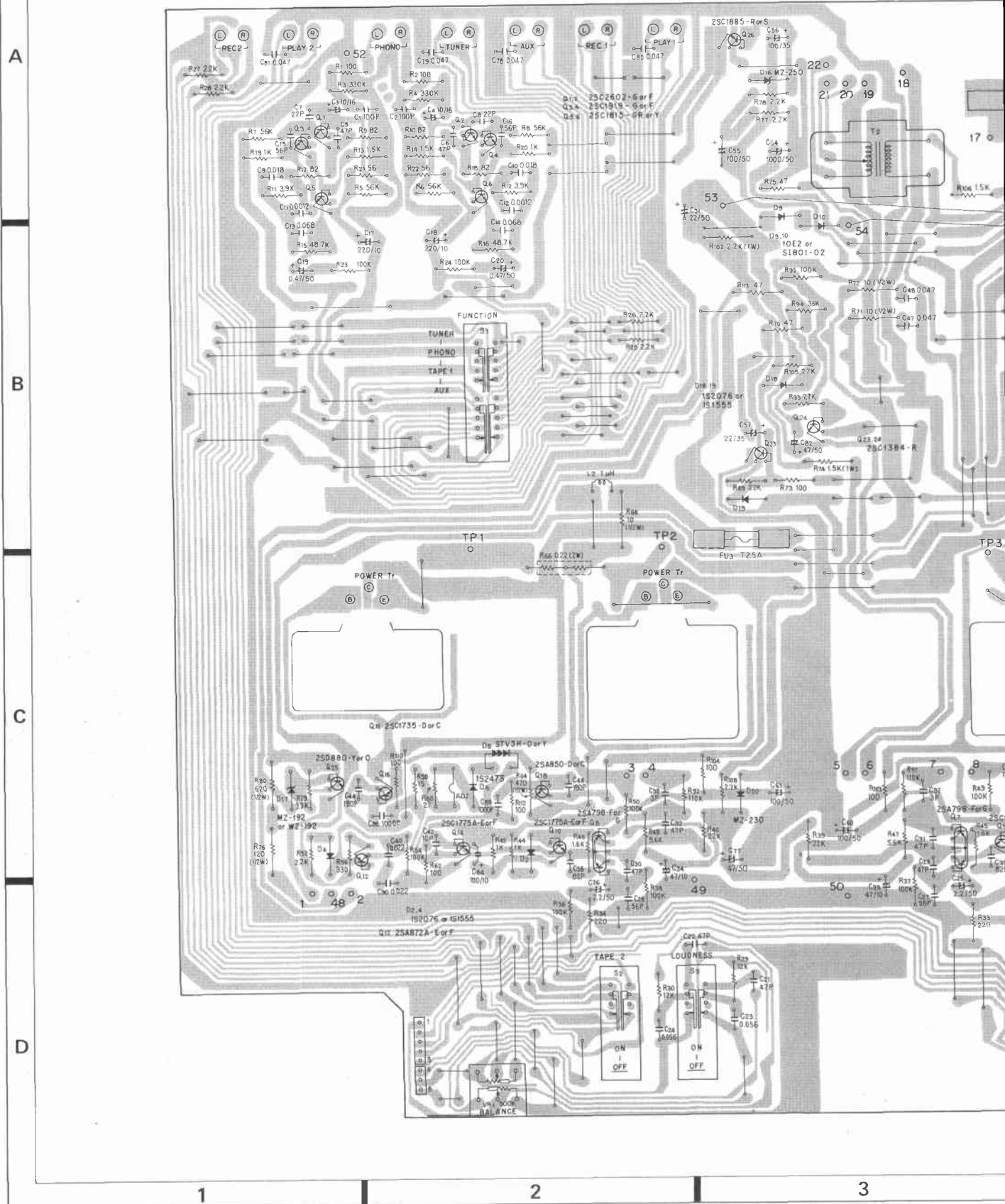
Symbol	Description	Part No.		
		KU type	HB type	HE type
	Front panel assembly	ANB-848	ANB-896	ANB-896
Δ T1	Power transformer	ATT-666	ATT-705	ATT-705
Δ FU1	Fuse (3A)	AEK-101	.....	.....
Δ FU1	Fuse (1A)	.....	AEK-402	AEK-402
Δ FU2,3	Fuse (2.5A)	.....	AEK-403	AEK-403
Δ FU4	Fuse (2.5A)	.....	.....	AEK-403
Δ S6	Lever switch (POWER)	ASK-520	ASK-521	ASK-521
Δ C1	Ceramic capacitor 0.01/250V	ACG-001	.....	.....
Δ	AC socket	AKP-032	AKP-044	AKP-026
Δ	AC power cord	ADG-023	ADG-051	ADG-041
	Screw	ABA-145	ABA-116	ABA-116

PACKING AND FURNISHED PARTS

Symbol	Description	Part No.		
		KU type	HB type	HE type
	Operating instructions (ENGLISH)	ARB-352	ARB-366	ARB-366
	Operating instructions (GERMAN/FRENCH)	.....	.....	ARD-148
	Packing case	AHD-749	AHD-776	AHD-776

4. P.C. BOARD PATTERNS

AF AMP Assembly (GWK-154)



4

5

6

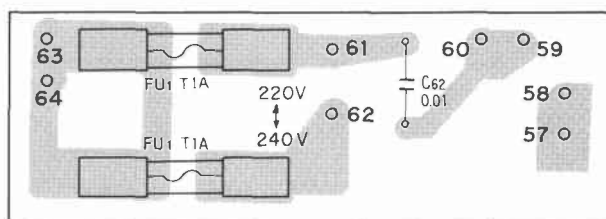
A

B

C

D

Fuse Assembly (GWX-494)

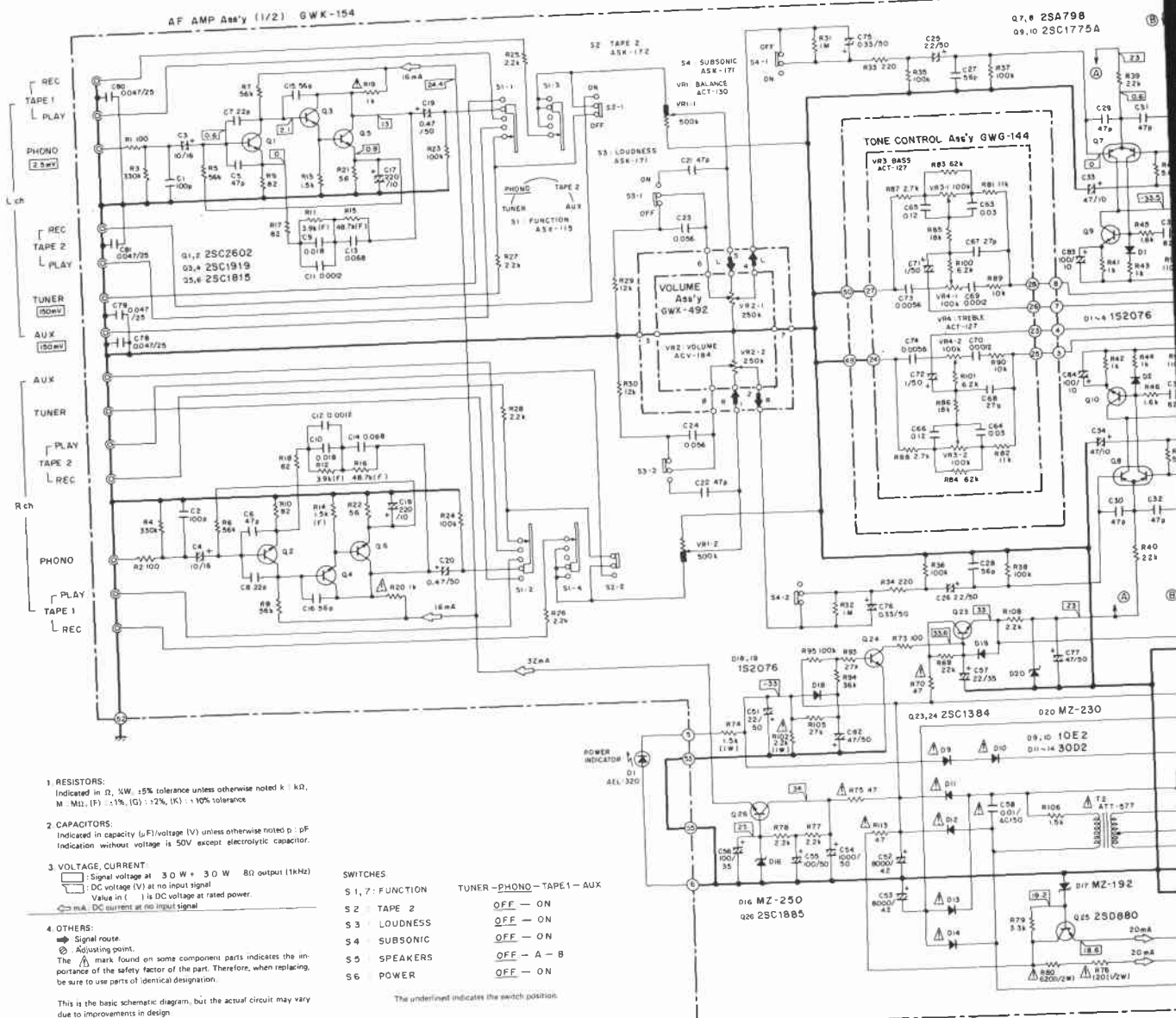


NOTE:

The only difference between following assemblies in models SA-510/KU, HE and HB types lies in the assembly parts numbers. All circuit and parts are exactly the same. For P.C. board patterns refer to the service manual for SA-510/KU type.

Description	Part No.	
	KU type	HE and HB types
Tone control assembly	GWG-137	GWG-144
Switch assembly (A)	GWS-212	GWS-238
Switch assembly (B)	GWS-213	GWS-239
Volume assembly	GWX-457	GWX-492
Headphones assembly	GWX-458	GWX-493

3. SCHEMATIC DIAGRAMS FOR HE AND HB TYPES



SA-510/HE, HB

NOTE:

The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

